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THE
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THE NORTH AMERICAN DESERTS

BY

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Four years ago I had the honor to report to you on the observations which I made with Professor Schönbach in the Egyptian deserts. Since that time I have been again in Egypt, have touched the desert of northern India, and have been much occupied with the literature of deserts; and last autumn I seized the opportunity offered by the fifth International Geologic Congress at Washington to look at the American deserts.

The great geologic excursion through North America, under the professional guidance of our American colleagues, passed for some days through deserts and gave me opportunity for several side trips into neighboring deserts; afterward, in company with Dr von dem Borne, I spent two weeks in travelling through the deserts of Arizona, California and Texas, and met with a hospitable reception in the tent camp of Professor Streetsville, of the geological survey of Texas. Through his kind leadership I was enabled in a few days to visit the most interesting points in western Texas, in the Sierra de los Dolores, and in the Sierra del Diablo.

Our first acquaintance with a desert-like region was made in the "Bad Lands" of Dakota. When we awoke on the morning of September 5 our train was on the prairie. A gently undulating plain allowed our eyes to roam to the distant horizon. The gray morning soil was covered with a dense nap of grass, now sulphur-yellow, now rust-brown. Over it extended, gossamer-like, a silvery gray veil, formed of countless delicate ears of grass. Wherever a depression gave rise to an accumulation of water there appeared a dark-green swamp carpet, overgrown with reeds and rushes, and where the dry prairie grass had been lit by sparks there were seen black bare spots with jagged fire-eaten edges and studded with small, blackened drift boulders. Inquisitive prairie-dogs sat upright on their hills, a few butterflies were on the wing, one small bird soared in the clear air; on all the wide plain there was nothing else to strike the eye.

In the afternoon there emerged on the horizon sharply outlined table mountains, and at Kurte station we found ourselves in a landscape full of "Zeugenberge" and mesas. The Americans call the "Zeugenberge" very appropriately "sentinel buttes;" and for the blind-pouchlike wide valleys penetrating into the table mountains the cowboys use the expression "rim-rock." The rimrock valleys are of great value to the cowboys, because they can drive their great herds into them without danger of losing a single head; for the steep slopes from the gateway to the innermost recesses of these valleys prevent all possibility of escape. Quite similar "sentinel" landscapes were seen by us again in Utah, Colorado and Arizona.

At Ogden, a Mormon town at the northeastern end of Great Salt lake, I left the train in company with Professor Krusnoff of Karkof. We traversed the tree-lined streets of the pleasant little town and ascended the slope of the Wasatch mountains. Fields of *Helianthus* covered the plain, low oak brush grew along the granite mountains, and scattered opuntias and artemisias proclaimed the dryness of the climate. Finally we reached a gravel terrace 100 paces broad, which could be traced as a horizontal band along all the mountain slopes, 120 meters above the bottom of the valley; this was accompanied by similar parallel lines which might be observed along the rocks to a height of 300 meters.

A superb picture here offered itself to our gaze. At our feet, surrounded by fertile fields and orchards, lay the town of Ogden. An ingenious system of canals irrigated the land and caused a

verdant oasis to rise in the midst of the salt steppe. Next we surveyed the bright blue mirror of the saline lake, from which jagged islands emerged in picturesque beauty; toward the west there followed a white lustrous plain bounded on the far horizon by violet mountain silhouettes.

At present the lake has an average depth of 4 meters; but there was a time when the wide valley basin, 4,500 square kilometers in extent, was covered by a lake 300 meters deep. At that period the breakers cut a terrace in the rocks of the lake shore, and while the lake water evaporated and its level gradually sank, there were formed the various shorelines which now may be traced as horizontal bands in parallel course along all the mountain slopes. Great Salt lake is the last scanty remnant of old "Lake Bonneville," and the salt desert is a dried lake bottom.

In yellow radiance the sun's disk sank behind the mountain crags when on the Southern Pacific railway we traversed part of the salt desert; the night fell quickly, and soon the desert gleamed in the moonshine like glistening hoar-frost.

When we set out next morning from the lonely station of Terrace on a ramble over the desert our expectations were raised to the highest pitch. Krassnoff recalled his travels in Turkestan; I remembered the Arabian desert; and we looked around anxiously, scanning with care each pebble, each sandhill, each sage bush and each rock, in order to compare them with our experiences in Africa and Asia. While Krassnoff quickly felt at home and everywhere discovered resemblances to the steppes of Inner Asia, I marveled to see a desert picture unwonted and strange to me. Wherever my eye might stray, it rested on the yellow bloom of *Halophyta*, the silver-gray bushes of *Artemisia*, and spiny cactuses. Among creeping opuntias I saw a few small moss cushions, and at the foot of the granite hills grew juniper trees two meters high with stems a foot in thickness. We walked in short serpentine windings among bushes a foot in height; some scattered spots were covered with brown pebbles; small sandy water-courses wound, with many a loop, to end on the dazzling white salt plain. As we approached that plain the scrub became scantier, rising island-like from the flat surface, and finally there lay before us the floor-like horizontal plain of saline clay, entirely devoid of plants. The salt formed a coat of fine powder over the gray clay, and the small crystals glistened and sparkled in the sun like fresh-fallen snow. The ground was

honeycombed with polygonal heat cracks and reflected a glare so intense and dazzling that one could look about only with half-shut eyes.

Krasnowoff told me that this landscape agreed in many points with the deserts and takyr of inner Asia, but I found myself face to face with an entirely new type of desert. I was wont, after several hours' ride over gravel-covered serir or brown hammals, to come to a wadi distinguishable, even from afar, from its plantless surroundings as a green band; I had often been engaged with my bedouin for an hour in gathering dry scrub in order to have the fuel necessary for the fire. Here in the American desert there were plants in abundance, and only the increasing salinity of the soil checked vegetation. Apart from the salt-covered lowlands, I received everywhere the impression of an Egyptian wadi vegetation. Bush stood beside bush, and between them was plantless soil; but on looking over the region from an elevated point, everything seemed sprinkled with blooming green bushes. Now this phytogeographic habit, or, if I may so term it, the "wadi character" of the whole desert, is not confined to Salt Lake desert, but a similar abundance of plants was found by me in the Mohave desert, the Gila desert, and the deserts of western Texas.

It may often have called forth a smile on the part of my companions to hear me complain again and again of the many plants in the North American deserts; but I cannot sufficiently emphasize the difference as compared with northern Africa. The salt-covered tracts on the shore of Great Salt lake, the bottom of the ancient lake Bonneville, are indeed absolutely plantless, and in this respect delight the heart of the desert traveler; but it must be remembered that in this case it is merely the increasing salinity of the soil that kills vegetation. And when we recall that we here tread on the bottom of a drainless, desiccated diluvial lake, the theory of a Saharan sea, which in the case of northern Africa may well be assumed to have been definitively refuted, might seem to find complete confirmation in Great Salt lake of Utah. There we have a desert whose poverty in vegetation is an effect of evaporated salt water.

I supposed at first that this great wealth of plants in the desert of Utah and Colorado is a consequence of the great topographic altitude, for these deserts have an altitude of more than 1500 meters. The plateau of the southern Gatala in the Arabian

desert in fact is also much richer in plants than the lowlands of the wadi Arabah. But in the low-lying deserts of southern California I soon convinced myself that this conjecture was incorrect. The depression of the Colorado desert, 260 feet below tide, was unfortunately traversed by me at night, from Indio to Tortona; but the picture of the landscape which presented itself early next morning at Aztec was almost as rich in vegetation as the Van-horne desert in western Texas, although Aztec lies at an altitude of 500 feet, Vanhorne at 4,500 feet. It is apparent from this that topographic altitude is not the cause of the wealth of vegetation in American deserts. It seems, on the contrary, either that the average precipitation in American deserts is greater, or that American desert plants are better adapted to dry air. According to Mr Marché E. Jones of Salt Lake city, that place has an annual rainfall of about 15-16 inches; Salt Lake desert about 6-10 inches.

The conductor of the Southern Pacific railway, who has traveled through Gila desert daily for many years, told me that there is a rainy season in that desert in July and August. The desert sky, at other times so clear, is then clouded; there are occasional thunder-storms in the afternoon; and irregular rain showers fall, their area being so limited that at times the strip receiving rain is only 5 kilometers broad, though the water there covers the ground to a depth of a foot. For the deserts of Texas, according to von Strickerwitz, a mean annual amount of rain cannot be given at all; for in some cases it does not rain for two years, and again there is a rainfall of two inches in two hours.

The plants of the American deserts attain no inconsiderable dimensions. In southern Arizona we rode for three hours through a desert in which columnar cactuses half a meter in diameter and 7 meters in height were to be seen by the thousand. Never have I witnessed so curious a sight as these huge specimens of *Cereus giganteus* in such multitudes. The salsolaceous and artemisioid form bushes a meter in height, and their branches are of an arm's thickness; and, while in the Arabian desert one finds but slight protection against the sun's rays under acacias and tamarisks, in Utah the upper slopes bear shade-giving juniper trees.

While there exist thus in the conditions of vegetation wide differences, on the other hand there are a series of important

and characteristic desert phenomena in North America and Africa that present surprising resemblances. In the beginning of October I rode from The Needles through the Mohave desert. On both sides of the railway extended an almost horizontal plain, gently rising toward the granitic and volcanic mountains. So far as the eye could reach, I saw everything covered with scattered desert shrubbery, sprinkling even the slopes of distant mountains in the form of small green points. All mountains, mostly volcanic rocks, dikes and ash-cones, rose island-like from level desert land. The horizontal plain and the steep mountain slopes were not linked together by a debris-covered foothill, but plain and mountain slope intersected without any transition. It is surprising to see steep mountainous islands rise from a sea of debris, and yet this phenomenon is characteristic of all deserts that I have seen in Africa, India and North America. Just as the granite mountains of Sinai or of the Gharib rise island-like from the debris-plain in imposing dimensions, and as the plains rise toward the base of the mountains so slowly as hardly to be perceptible until the craggy granite colossus rears its head like our own mountains of massive dolomite, so in the Sierra del Diablo do the plateaus of the Carboniferous limestone rise steeply from a boundless plain, of whose accumulated debris masses one may form an idea on learning that near Terbert at the foot of the Sierra Van Hornes a well was dug 1,050 feet deep in debris. The phenomenon becomes especially striking, because it is noticed that there are no debris deltas at the mouths of valleys 1,000 feet deep; there, too, the horizontal plain is seen to abut directly against the steep slopes of the mountains.

If we conceive each landscape picture as the result of definite processes of denudation, the relation of such a desert plain to its rocky cliffs will at once indicate that denudation in the deserts acts differently from what it does in Europe. But this horizontality of the surfaces of denudation has a further claim on our interest from another point of view.

In the geologic exposures that exhibit to us sections through parts of the earth's crust it is found very frequently that the rock is parted by horizontal planes into layers lying above each other. This structure is called stratification. Now that which in the cross-section of a block of strata appears as a horizontal plane is merely the expression of the fact that at a certain time in the formation of that body of strata the freshly formed sedimentary

surface had the character of a widely extended and approximately horizontal plain. If we now look around on the earth's present surface for regions in which the freshly formed deposits with horizontal planes are being formed, we find them, in the first place, at the bottoms of seas and large inland lakes. In them are formed deposits with horizontal surfaces—that is to say, stratified deposits.

Now, it is very important to note that besides the sea bottom there exists another class of regions of the earth's surface on which the products of denudation are spread with great regularity over wide horizontal areas. These are the deserts and steppes. Both therefore are areas which must not be left out of view in the discussion of the origin of stratified deposits. Stratification does not all originate under water.

The activity of denudation is a double one. It destroys the rocks of the earth's surface and transports the comminuted material from its place of origin. In our regions it is water that destroys the rocks; it dissolves them chemically and frost dissuring comminutes them mechanically. Water is also in our latitudes the most important transporting agency. In the desert it rains but seldom. The time in which water may there destroy rocks and transport debris is at most 65 days in the year. It has been thought that during the remaining 300 days denudation in the desert is at a standstill; yet careful, unbiased study teaches that in these 300 dry days denudation is intense. A burning sun beats down on the rock surface, unprotected by any plant cover. In Texas daily variations in temperature of 40° C. are not at all rare; and large and small stones are cracked by the heat. Often have I picked up the halves of such cracked pebbles still fitting together. In Texas I saw granite blocks as high as houses divided by wide cracks, and Mr von Streerwitz told me that he had seen and heard the cracking of such blocks. The variously colored constituents of the granite become heated to different degrees and fall apart in the form of coarse gravel. In a valley of the Sierra de los Dolores a rainfall had filled the rocky bottom of the valley with granite gravel to a depth of 3 feet; this gravel had been formed by insolation on the granite rocks in the course of years. Deep crevices weather out of the granite wherever the water remains longer, and these increase the mass of the products of denudation.

Thus rocks are destroyed by dry heat at a time when denudation by water sinks to a minimum. On the 300 dry days of the year the process of rock destruction continues uninterruptedly. On rainy days, of course, the loosened rock material is carried off by running water. That such a desert rain-storm, falling like a cloud-burst, may carry off immense masses of debris needs no proof. The question is merely this: Is the transportation of the products of denudation at a standstill in the desert during the 300 dry days? To this question also we must reply in the negative. Almost daily I saw columns of dust traveling slowly over the plain. These raise great quantities of loose material high in the air; there this material is caught by horizontal air currents and carried farther away. I also saw in Colorado how within one-quarter of an hour the desert plain was wrapped in clouds of dust so dense that one could hardly see two kilometers away, while previously the eye might discern everything within a radius of many miles.

Thus we see that even when it does not rain there exists in the desert a transporting force, and that on the 300 dry days neither the destruction of rock nor the transportation of the products of destruction is at rest. We also recognize that this "dry denudation," as it has been called by an English reviewer, is of intense power and may well be compared qualitatively, though not quantitatively, with the denuding effect of water. It will be exceedingly difficult, however, to find a scale by which erosion, that is, denudation by water, can be compared with deflation, that is, denudation by wind; and so long as such a scale is wanting, all conclusions regarding their relative activity must rest on subjective estimates.

Many rocks and rocky surfaces of the African deserts are covered with a peculiar coating, which may be designated as "brown protective coat" or "desert varnish." This coating is also found widely distributed in the deserts of North America, and if I did not succeed in forming a definitive judgment concerning the origin of this product in Egypt, I have now in America made observations which promise to bring the problem nearer to its solution. Mr. von Strömvitz in the beginning of September had made excursions to several parts of the Sierra del Diablo, observing instances of the protective coat, which he intended afterward to show me. Toward the end of September cloud-

current being 1.5 m/sec and was 100 m from shore of outlet of
the fjord. The surface of the storm, with a 10 m high sea, was
seen that the protective wall had been broken and the water
was by a few meters and it was again at some distance from the
shore. There was a strong gust of wind and a few people
and a few boats were seen. The water was very rough and the
flood of the water had been active, so far as the water was
removed. From the shore, the water was very rough and the
water was very rough and the water was very rough.

(c) find the town's production cost is not affected by the amount of water used.

As I had at the time of my first experience, whenever I returned to London and to

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Professor Ken Kuperfeld has been diagnosed for a year or two with cancer. The cancer processes have spread from the prostate gland to the lymphatic system and to the lungs. He is now being treated with radiation and chemotherapy. He is a very good person and a very good teacher. He is a very good person and a very good teacher. He is a very good person and a very good teacher.

Little is known about the electrical properties of these polymers. In this paper we report on the electrical conductivity of poly(2-vinylpyridine) (PVP) films. We found, also, that free from moisture, the conductivity of this polymer film increases exponentially with time in the course of a few hours at room temperature. It was suggested by the results that the polymer may contain a small amount of water, which is gradually absorbed from the atmosphere.

we would be as free to deny their denuding agency even in our regions. There are so many phenomena here as which can hardly be explained as effects of water at all, but which become easily intelligible as soon as we recognize dry air in motion as a geologic force. There is perhaps not a spot on earth that bears no trace of erosion; neither, on the other hand, is there a spot where the necessity of wind denudation & deflation is entirely wanting. It is only a question of unbiased observation of nature and of not attributing to water things which it cannot accomplish.

How easily fogged or and to prove intimate union & erosion and deflation it is shown by an excellent example, the famous canon carved out in Arizona. Most of the travelers of the great expedition expected that on their journey from Flagstaff to the Colorado canon they would sail through a desert. What was our surprise, therefore, when we found that it led for 150 kilometers over a plateau more than 2500 meters high, with prairies and beautiful pine woods. The steady growth of *Pinus ponderosa* extended to the very edge of the canon gorges, and as we climbed the last steep slope we were able to see a view in two steps of the canyon without realizing how close we were to the coveted goal. One step, and we stood on the verge of a gorge 200 meters deep, and only at a distance of 20 kilometers we see the steep verge of the other slope. A range of cliffs as yet unclimbed in the purple depths; only the top, most craggy of some peaks, were bathed with the ruby glow of the rising sun. Our eyes swept along the horizon, and as far as they could roam there appeared an entire new world of forest; only toward the southeast toward a covered bank of forest, high branches overhanging like an overhanging wall toward the north more than 40 kilometers away in an air line, across the grand 1 km mountain range. Again we looked down to the bottom of the pit, gradually illuminated by reflection from the upper rocks glittering in the sunlight. The rock was seen to glow as with transparent light, and only with the aid of the eye distinguished dark spots of heavy shadow. The glow on the deep bank showed of the abyss deepened, and as the sun rose higher and higher the shadows grew deeper. The path of the light is not only dark patches of rock seen, but a trail of light as it itself. At last we were able to see the steep walls to recognize with surprise the desert across the canon from the bottom, and even at one point to see the river flash gold.

THE ALASKAN FRONTIER SURVEY

INTRODUCTION

By T. C. MERRILL

Presented before the Senate of March 24, 1892

As my countryman to whom Mr. Merrill and Mr. Turner will have to say to you tonight I have ever the most of to say some thing with regard to the course of the expedition (for which I am very indebted to you) and to the very many persons who have taken part in the fact that it has been the subject of a special committee.

I need not mention that with the war which has been in Alaska and which has been a long way off for the sake of the sum of \$2,000,000. There can be no doubt that this was a very and probably a very great deal of the time as well as the money. The territory has been divided into 17,000,000 acres which is the most and we are just beginning to secure it to inquire about the real resources which will some time in the future be available. It was perhaps not generally expected at the time if a survey was expected at all that in the progress of the territory we were also going to possess it. Two or three later on and we were somewhat provoked by the discovery. One of these is with regard to the boundary between the States of Alaska. In the possessions on the coast between North America. The boundary line was originally defined in a treaty between Great Britain and Russia in the year 1825, and in the case of Alaska for the last of us, and no interest in the boundary line as it then is.

Although it was doubtless thought at first that the survey and the work which has been done has at least come to a generally recognized that one of the things is very satisfactory, by reason of the fact that it was based upon the very most important and available of the data that was available. I may remind you briefly that the treaty between the two nations began in

of the northernmost extremity of Prince of Wales Island, which point was supposed to be on the parallel $55^{\circ} 40'$ north latitude. The "11th parallel" was then along the Port and Admiralty Islands, and the 12th parallel of north latitude is marked 1° from the equator, and was supposed to be the treaty line. Now the line marked by the admiral of the voyage of 1841, as parallel to the equator, is 1° 30' north, as with the 141st degree of longitude west of Greenwich. From this point a line is extended along the 141st meridian west from $55^{\circ} 40'$ to $51^{\circ} 40'$ north, or the "10th parallel," which is the line extended in the treaty between the two Empires. In every description it was agreed that all of the islands between the 141st and the Prince of Wales should belong to Russia, and, in case of our purchase, to the United States, and also that whenever the extent of the range of mountains should be determined by a greater distance from the coast than the extreme length, the limit of the possession of Russia should be formed by a line parallel to the western slope of the coast line, never more than one mile from the shore.

It was then agreed that the boundary line is divided into two parts which differ essentially from each other. One of these is that line which extends from a point near the mouth of the Yukon to the sea, the latter part of the line extending west from thirty miles and runs nearly parallel to the frozen ocean. This, being an uncertain and line, can readily be located by astronomical methods and can be given out in a satisfactory manner. That part of the line, however, which extends what is known as southeast from Alaska from the British possession, is very uncertain and easily mistaken. At the time the treaty was made, the coast of Alaska and Great Britain, the most important of which was the coast of the United States, was not yet fully explored, and it was not possible to ascertain the exact location of the coast of Alaska and that part of North America. It was not fully certain, however, at the present time, the location of the coast of Alaska, which was ascertained by the parallel of the coast line, and the line of the coast.

It is therefore necessary to look upon the line of the boundary line, that is the line which is the line of the coast, as a line which is the line of the coast, and the line of the coast is the line of the coast.

It is now known that the longer the line of the coast, the more the line of the coast is the line of the coast, and the line of the coast is the line of the coast.

men and topography as would be necessary for the exact location of the locations of the observing camps, and to establish permanent monuments as nearly as may be upon the meridian line.

These two parties, one to occupy a camp on the Yukon river as nearly as possible where it is intersected by the 141st meridian and the other on the Porcupine were directed, respectively by Mr McGrath and Mr Turner, whose observations are set forth in the following papers:

It was estimated that each year would be sufficient for the work, but a great deal of the work on this estimate was a liberal over-provisioned order, by which of course one had, remained in that part of the estimate. It was found, however, that these conditions were extremely undervalued, especially for water, food, work, and work, and it was continued, and less rendering observations for a long time, absolutely impossible. The extreme cold and stormy weather and the work itself, all of which of course would have stood in the way of a speedy completion of the task, and it was impossible to carry out the astronomical observations. It thus happened that, notwithstanding the rigor of the climate and the difficulties, the duty, and the possibility, of obtaining supplies from the coast was not, the two parties were obliged to remain in the interior of Alaska during the winter. Now and again the unfavorable conditions under which they existed during the winter, every notwithstanding both parties returned in good health and in good condition. Indeed there was scarcely a case of even ordinary illness during the entire campaign, a fact which must reflect great credit upon these men charged with the management of the parties.

So far as we have been able to ascertain, by correspondence and comparison with the reports, the work which Messrs McGrath and Turner were charged has been carried out, and the results satisfactory and must reflect great credit upon these gentlemen. I am sure they have very much to tell us with reference to the interest and the nature of experience in the Alaska territory, and unexpected rigors and I shall not longer stand in the way of their journey.

IF THE BOUNDARY SOUTH OF PORT FLANK

is

J. B. McARTHUR

As the address of Dr McArthur should having satisfactorily described the places which caused our party into the interior of Alaska, I shall confine myself to a plain statement of observations upon not only the objects of interest connected with the people and country that we have just so briefly observed, but during a two years' stay in our great north-western possession. It may not be uninteresting attention to a new subject in its about this vast territory whose remoteness from the rest of the country has caused but I take occasion to be particularly possessed and character of the people at large and the rights of certain of its and time to be made to present.

It is a fact that the great number of them on a few small islands of the coast and been entirely interfered with.

Alaska has an area of nearly 584,000 square miles. Its extreme length in length the estimated length of the American coast and total coastline being 14,000 to 15,000 miles by 7,200 miles.

The great ice frozen during the northern coast is the result of the greatest winter in the world. Its islands of Saint Paul and Saint George are the breeding places of the fur seal for hunting which a company pay to the United States government at a royalty upon the skins (when the maximum value is all well as on the proportion of the cost of the whole of Alaska, in the north of the whole extent of the coast and inland mountain ranges of the coast and the coast to the coast are the most valuable of the most highly prized and the most valuable animals, the seal. On the banks of the Alaskan peninsula the Fish Commission steamer of *Alaska* was for the use of the valuable fishery, the only one of the kind in such a range as to make the seal a very important factor with the rich fishing banks of Newfoundland, and at the southern coast a large and growing population is profitably employed, and at the great Treadwell mine on the gold is the largest mine in the world, is engaged in crushing Alaska coal and every valuable bay and stream on the southern coast so much as there are to be found, and the importance of this industry may be appreciated when it is considered that the season's pack for 1880 amounted

Calvin Bartholomew (and Western) can't help but be a little bit of a mess, and the power of the power is very and is to have the very best of the power. The great reward of the power is to have the power. The great reward of the power is to have the power. The great reward of the power is to have the power.

1000 ft. and about 100 ft. above the level of the sea. The soil is a light brown sand, and the vegetation is a low, scrubby bush. The water is clear and cold, and the temperature is about 50° F. The water is very pure and is a good source of drinking water. The water is also used for irrigation. The water is a good source of food for the fish and the birds. The water is also a good source of food for the people. The water is a good source of food for the people. The water is a good source of food for the people.

For over a century, when a farmer has a heavy season, he can't get his wheat to the market. He has to store it in his barn, and when the market is low, he has to sell it at a loss. The government has a plan to help him. It will buy his wheat at a low price, and store it in a government warehouse. When the market is high, it will sell the wheat to him at a low price. This will help him to get a better price for his wheat.

[illegible]

question is, can we get an idea of the nature of the approximate solution for the case $\alpha \rightarrow 0$ if β is small?

and $\mathcal{P}(\mathcal{P}_2)$ is arbitrary and \mathcal{P}_1 is the set of all \mathcal{P}_2 such that

The fauna of the lower York river is the most miserable I have ever looked to see. I have seen in Alaska the personal cleanliness they seem to have the exception of it was distressing to note the terrible diseases that run at some of the settlements and wasting away. The chief reason of this condition is the removal of the portion of the population that could support themselves. They are not doing it for themselves. It never has been a place where I would make it acceptable to my "Zem" people and at present I have about 1000 people here and to change results. Looking the worst subject in a very uninteresting object for not a few more people except the white man. The lower part of the delta is fertile and crops and spring, and a few houses dwell in it but I have to look for a few about none. But just as soon as the waters subside the people return to their land, and so the place is always a place in every out of only, on a small scale, the worst of the kind and drains the lower river. The condition of persons living together with an almost exclusive fish and fowl and the year results a scene terrible for a of consequence in the black water and various points we saw few miserable creatures whose condition

long to meet a fleet row of sail-boats and California boats also expected to show at the regatta, a very short time.

The principal sources of worry and discomfort at our wintering are to be expected in the winter and dark days. I wintered on the largest day of summer. Our first winter was not so bad as our worst. Our eyes were sore of the smoke and dust and we had to carry out a great number of hours each day during the month of December. A day of no reading or writing could be done. The quarters were not the best of additional heat, and as we only had enough oil on hand to allow us to keep a lamp going for four hours per day we had nearly a dark hour to endure, and have been as it is appeared almost as if we had the long day of the summer period to which some people even compare the length of winter, they appear to become nervous, and on the whole, I think it is not unusual for men to become nervous, and we are not even an exception. At camp I was soon we were at the time of our wintering, and the houses were not so very comfortable. From about August 20 to August 10, and in June at night and found that we could read by natural light. The worst of some members of the party suffer severely from nervous headache and insomnia, and I have not seen to help them in any way when the hypnotic coils were used to soothe their nerves.

Among the children in the interior and camp I found only one a year we could not recognize of the dress which the Indians wore near us, and were now indeed were the days that some of the most of people called ending as the beginning of the end of the world. Taken as a whole, the Indians are all our friends and are not at all hostile or violent. Never did they occur that the white men who came among them, any trouble, and I have to the relation of the two races have been of the most friendly and pleasant nature.

The Indians rarely notice the necessity of sewing and never find a needle or thread. The Indians in our camp, and I regret to say also the white men, are not at all of Indian origin. A large number of workmen in the interior are now for whatever they can get for a salary at a high price, and are working in the interior and receive from ten to four dollars per day, which is relatively much more than the eight dollars paid to white men.

What the outcome of the Alaskan project may be as the world may see it, will be seen in time. The Alaskan project is now being carried out in every stream in the country, and the Arctic

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Last July a woman named Nelson took a long boat with 2000 lbs of supplies that Alaska gives out on a lot of the coast. I had with a wave for it to go there, but had a charter we expect that one of the streams will not be there until the autumn so I am sure that when they return to the trading posts after a long season's prospecting they will find a poor fishing boat here. As all the government boats now they must return to the stations to the middle of their short workings as to see what the season will last in light, and as the small boats are new and it will happen to the one stop, or that one is to be order or with Saint Michael, and force all hands to leave the country or else face the possibility of starvation as was the case in the fall of 1892. It is a very risky venture trying to live on the country in the north of Alaska.

III THE BOUNDARY NORTH OF FORT YUKON

BY

J. HENRY TURNER

There is perhaps no portion of the vast territory of Alaska so little known as the country stretching northward from Fort Yukon to the Arctic Ocean eastward to the international boundary and westward to the headwaters of Koyukuk river. Simpson and Franklin skirted its northern shore. Allen penetrated into it a short distance, and they proved the existence of a mountain range trending to the eastward. Notwithstanding the fact that the summits of only two intervals are visible in the horizon to the north of Fort Yukon, the impression has long prevailed that the river course extended to the shores of the frozen sea. This has even been advanced by an explorer of note within the last few years. Travelers have deliberately avoided this region for the obvious reason that the steepness and the rapids of the rivers and the absence of trading posts and of any mode of communication with the outer world would render it peculiarly unsuited for summer exploration.

It is believed that certain discoveries have been made in a journey northward from Fort Yukon in the spring of 1890 which throw light upon the geography of this entire interval. I am thus constrained to revert to this subject in this place of my remarks.

Mr. A. C. Smith, long known to the reader as the discoverer of the old Fort Yukon site, was accompanied by two persons to a point on the August 31st summer journey with some of Simpson's river party and the ship, but a small boat left Fort Yukon and three days afterwards returned camp. It was found that the road leading to the river was for a distance of a mile or so a narrow, shallow stream, probably an extension of the dry stream which had been found in the lowest summer.

Several miles above the point where the lowest of the old river was found, Captain Johnson returned to camp, but the river was still found as plainly indicated by water marks along the banks and

interrupted by snow storms as of frequent occurrence, beginning in August. Ice began to form along the river banks in early September, and by the end of October a steady mantle covered the country, and as the storms were met by cold winds. The barometer and all observations were ready for comparison by the next day. The days rapidly shortened as the season progressed, and on November 1 the sun in its course toward disappeared beneath the horizon. During the shortest days lamps were extinguished at 11 a.m. and lighted at 1 p.m. By 2 p.m. observations upon the stars were perfectly practicable. The state of affairs prevailed until January 29, on which date the sun reappeared. As the first few hours rays of the sun were struggled through the mist and numerous fogs, the sun, the stars, and, reaching forth from the cabin, they appeared about like children with excess of joy.

Many Indians visit our camp during the winter months, in best season of the year, and a supply of seal-skin is brought off every month on the coast to make a comfortable place for the Eskimos to live in. Two deer were, with a large number of seal, brought off to us. The dogs, usually fed in the store, were not fed and had to be fed together with the seal-skin. As the dogs of the Eskimos are not fed, we had to feed them with the seal-skin. As the dogs of the Eskimos are not fed, we had to feed them with the seal-skin.

Among the coast tribes and the Indians possess large herds of reindeer, and some of the Eskimos, who are of a kind that their dogs were in the cold winter months. A reindeer, with the exception of one or two, was not fed. In the month of November, when the sun was not visible, there was a great deal of necessity for the Eskimos to make a journey for the purpose of being able to travel.

As stated before, some of the Eskimos had some food, and some of the Eskimos had some food. As stated before, some of the Eskimos had some food, and some of the Eskimos had some food. As stated before, some of the Eskimos had some food, and some of the Eskimos had some food.

Some of the Eskimos had some food, and some of the Eskimos had some food. As stated before, some of the Eskimos had some food, and some of the Eskimos had some food. As stated before, some of the Eskimos had some food, and some of the Eskimos had some food.

large. The Nainia Kutluks, or Lake Indians, inhabiting the region of the upper portions of Kanaport House, the Nainia Kutluks of River House, the Pangak Kutluks, or Black River Indians, residing upon the river of the same name, and the Eskimoes living in the vicinity of the Port of House. Excepting the Takumi tribes, the other natives economized much more sparingly with furs at Kanaport House. In former times the seal was a source of great profit to the Indians, but now, as nearly all seal-skins were bought up by the Nainia Kutluks.

During our ten months' residence but two skins of the seal were seen, one of the yearly total of other furs having been completely diminished. The greatest bulk of furs is now obtained from the Black River country, and consists chiefly of black bear and musk-rat skins.

Beckmoe, from the northern coast settlements near Kanaport House in order to exchange with the Indians for walrus-ivories, which are afterwards taken to passing wharves for whomever of the coast required as building materials.

Early in March it was decided to take a party of men west along the boundary to the shores of the Arctic ocean.

A request was therefore sent to Mr. Fortin, at Kanaport House, to provide transportation for the trip and engage the services of two reliable natives with sleds and a reindeer to guide them. This was accordingly done, and a contract was entered into for the engagement of a team, on March 25, bearing for the Arctic ocean. Two of the Indians, Edwaird and Moses by name, had traversed over the proposed route before, when engaged in trading with the Indians of the interior coast, so that a route was fixed to the shore. The temperature had risen gradually during the previous day, and bright skies and refreshing winds indicated that soon our way was open for making the start. In a heavy coat of dried moose, porcupine, and musquoy of caribou skins, with a rain-coat of skin, but well away in the event of sudden late, and quieted the start of the

men. My sled was loaded with a variety of food, various instruments for the determination of geographical positions, books, etc.

It was found when the final preparations were completed and the party started—American, Norwegian and English as well as the natives of the party. On the first day six miles were made, and the party camped for the night in a grove of spruce, with dry moss and wood for fuel, and a dry hearth. The mode of camp-

as practiced by the Indians and hunter as long there ever was
followed. A well-stocked spruce forested in a strip of spruce
with a number of dry wood in the immediate vicinity. After
cutting the trees down with the first part of the timber
about are removed and used as shown to clear away a space
twenty feet square and for a two or a half to three feet in depth.
An old stump of wood in a corner of the forest every
rod and the solution of the old stump and a half to one foot
laying several stumps in a row as a half of a hundred to be
as a small trunk. A quantity of dry timber is then thrown
on the opposite side and fired. Six men stand over a large

When it is time to put the models to work, the first step is to get the data and the model together. The data is fed into the model, and the model is used to predict the outcome. The model is then used to predict the outcome for the purpose of the study. The model is then used to predict the outcome for the purpose of the study. The model is then used to predict the outcome for the purpose of the study.

In a letter written of strong protest, however, that it was of little purpose and, in some degree, the bill of fare. We have, perhaps, the best in the world, but it expects to be away for a good while, and it is moved on to water, the last of which is a great one.

[illegible]

are some of the more common ranges for $m_1 = 4^{\circ}$ to 50° Fahr. That of the parka was recorded at dusk - 20° Fahr. By the morning the parka had covered the front of the house was on a mass of which had been thawed out before the parka became re-freezed.

After descending the ice cuttings, the route now lay over a vast wilderness, a by most striking looking flat tundra, running up on exposed spurs a range of 1000 to 8000 feet. Three rivers of this vast country to the west of the cuttings near the aster locality of the house. A large area was covered with ice, the rest was a low, flat, the water level was not worn away through the ice, the vapor rising from the exposure of the ice gave the appearance of a steam on a boiling spring. The river was followed by the shores of the Arctic ocean, passing the water of the great lake or through glacial canyons, were the wind whistled.

On the eighteenth day, April 24, a snow was recorded. At 11 hours was blowing for a time at least and the mercury registered 30° Fahr. A fire of driftwood was made and dinner was served. After the day of a snow storm. The morning was a cold day of the storm, it fell in the afternoon when the wind ceased and a long line of driftwood now was revealed starting the day at 10.

A good fair view was now had the coast all, even the mountains were made, and early the next day the return trip was begun. The stream was revealed in six days, a rapid, dry, one during the course of the country, the first temperature on the edge of the snow.

Although the season was nearly winter, the sun was on the northern journey, and the shortest ever seen of a day could be detected parts of the valley. The Three Rivers. The stream, which was followed to the ocean, was frozen to the objects but beneath the ice the water was still. The first day of the trip was a moderate

COLLINS AND FLETCHER

BY

† 1991-1992, 1993-1994, 1995-1996, 1997-1998, 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013-2014, 2015-2016, 2017-2018, 2019-2020, 2021-2022, 2023-2024, 2025-2026, 2027-2028, 2029-2030, 2031-2032, 2033-2034, 2035-2036, 2037-2038, 2039-2040, 2041-2042, 2043-2044, 2045-2046, 2047-2048, 2049-2050, 2051-2052, 2053-2054, 2055-2056, 2057-2058, 2059-2060, 2061-2062, 2063-2064, 2065-2066, 2067-2068, 2069-2070, 2071-2072, 2073-2074, 2075-2076, 2077-2078, 2079-2080, 2081-2082, 2083-2084, 2085-2086, 2087-2088, 2089-2090, 2091-2092, 2093-2094, 2095-2096, 2097-2098, 2099-2100, 2101-2102, 2103-2104, 2105-2106, 2107-2108, 2109-2110, 2111-2112, 2113-2114, 2115-2116, 2117-2118, 2119-2120, 2121-2122, 2123-2124, 2125-2126, 2127-2128, 2129-2130, 2131-2132, 2133-2134, 2135-2136, 2137-2138, 2139-2140, 2141-2142, 2143-2144, 2145-2146, 2147-2148, 2149-2150, 2151-2152, 2153-2154, 2155-2156, 2157-2158, 2159-2160, 2161-2162, 2163-2164, 2165-2166, 2167-2168, 2169-2170, 2171-2172, 2173-2174, 2175-2176, 2177-2178, 2179-2180, 2181-2182, 2183-2184, 2185-2186, 2187-2188, 2189-2190, 2191-2192, 2193-2194, 2195-2196, 2197-2198, 2199-2200, 2201-2202, 2203-2204, 2205-2206, 2207-2208, 2209-2210, 2211-2212, 2213-2214, 2215-2216, 2217-2218, 2219-2220, 2221-2222, 2223-2224, 2225-2226, 2227-2228, 2229-2230, 2231-2232, 2233-2234, 2235-2236, 2237-2238, 2239-2240, 2241-2242, 2243-2244, 2245-2246, 2247-2248, 2249-2250, 2251-2252, 2253-2254, 2255-2256, 2257-2258, 2259-2260, 2261-2262, 2263-2264, 2265-2266, 2267-2268, 2269-2270, 2271-2272, 2273-2274, 2275-2276, 2277-2278, 2279-2280, 2281-2282, 2283-2284, 2285-2286, 2287-2288, 2289-2290, 2291-2292, 2293-2294, 2295-2296, 2297-2298, 2299-2300, 2301-2302, 2303-2304, 2305-2306, 2307-2308, 2309-2310, 2311-2312, 2313-2314, 2315-2316, 2317-2318, 2319-2320, 2321-2322, 2323-2324, 2325-2326, 2327-2328, 2329-2330, 2331-2332, 2333-2334, 2335-2336, 2337-2338, 2339-2340, 2341-2342, 2343-2344, 2345-2346, 2347-2348, 2349-2350, 2351-2352, 2353-2354, 2355-2356, 2357-2358, 2359-2360, 2361-2362, 2363-2364, 2365-2366, 2367-2368, 2369-2370, 2371-2372, 2373-2374, 2375-2376, 2377-2378, 2379-2380, 2381-2382, 2383-2384, 2385-2386, 2387-2388, 2389-2390, 2391-2392, 2393-2394, 2395-2396, 2397-2398, 2399-2400, 2401-2402, 2403-2404, 2405-2406, 2407-2408, 2409-2410, 2411-2412, 2413-2414, 2415-2416, 2417-2418, 2419-2420, 2421-2422, 2423-2424, 2425-2426, 2427-2428, 2429-2430, 2431-2432, 2433-2434, 2435-2436, 2437-2438, 2439-2440, 2441-2442, 2443-2444, 2445-2446, 2447-2448, 2449-2450, 2451-2452, 2453-2454, 2455-2456, 2457-2458, 2459-2460, 2461-2462, 2463-2464, 2465-2466, 2467-2468, 2469-2470, 2471-2472, 2473-2474, 2475-2476, 2477-2478, 2479-2480, 2481-2482, 2483-2484, 2485-2486, 2487-2488, 2489-2490, 2491-2492, 2493-2494, 2495-2496, 2497-2498, 2499-2500, 2501-2502, 2503-2504, 2505-2506, 2507-2508, 2509-2510, 2511-2512, 2513-2514, 2515-2516, 2517-2518, 2519-2520, 2521-2522, 2523-2524, 2525-2526, 2527-2528, 2529-2530, 2531-2532, 2533-2534, 2535-2536, 2537-2538, 2539-2540, 2541-2542, 2543-2544, 2545-2546, 2547-2548, 2549-2550, 2551-2552, 2553-2554, 2555-2556, 2557-2558, 2559-2560, 2561-2562, 2563-2564, 2565-2566, 2567-2568, 2569-2570, 2571-2572, 2573-2574, 2575-2576, 2577-2578, 2579-2580, 2581-2582, 2583-2584, 2585-2586, 2587-2588, 2589-2590, 2591-2592, 2593-2594, 2595-2596, 2597-2598, 2599-2600, 2601-2602, 2603-2604, 2605-2606, 2607-2608, 2609-2610, 2611-2612, 2613-2614, 2615-2616, 2617-2618, 2619-2620, 2621-2622, 2623-2624, 2625-2626, 2627-2628, 2629-2630, 2631-2632, 2633-2634, 2635-2636, 2637-2638, 2639-2640, 2641-2642, 2643-2644, 2645-2646, 2647-2648, 2649-2650, 2651-2652, 2653-2654, 2655-2656, 2657-2658, 2659-2660, 2661-2662, 2663-2664, 2665-2666, 2667-2668, 2669-2670, 2671-2672, 2673-2674, 2675-2676, 2677-2678, 2679-2680, 2681-2682, 2683-2684, 2685-2686, 2687-2688, 2689-2690, 2691-2692, 2693-2694, 2695-2696, 2697-2698, 2699-2700, 2701-2702, 2703-2704, 2705-2706, 2707-2708, 2709-2710, 2711-2712, 2713-2714, 2715-2716, 2717-2718, 2719-2720, 2721-2722, 2723-2724, 2725-2726, 2727-2728, 2729-2730, 2731-2732, 2733-2734,

14 conducted by letter to prove the Society April 3, 1882

most pleasure of being
ing from the ship of Lieutenant John W. Under Charles H. Stockton,
U. S. N., and a most interesting account of the remarkable
career of the U. S. S. *Thetis* during the summer and autumn of
1880, from San Francisco through stormy seas, around point
Barrow, eastward to the mouth of Mackenzie river and thence
westward to Herald and Wratzel islands, where he returned
to his home port. It was a remarkable voyage, at a time when
Steamships deserved especial credit for the professional ability and
personal energy displayed by their crews, and so trying and so
successful a trip.

The account, as given and enlarged, has been written up by me, and handed to the printer as a preliminary for a very large and elaborate edition of *Switzerland*, November, April, 1891. The value of all your views to me, as regards the deepening of the history and geography with which the account of this journey may be written. No one was known to me in Switzerland, or was likely to have personal acquaintance with me, as I have not up to now secured the necessary opportunities for such visitations of the country. It is therefore with a feeling of very great obligation that I have

of several render that it has perhaps a few more examples, which are recorded as a number of months past by reference to the last full moon previous to the month of observation.

It is not at all typical "Western" that I never Mediate, long as as I have.

¹⁴Two months earlier, he had written to a friend: "I am—of course!—in no danger."

After the second round of the 1990 election, the party lost its seat, but the women, both and the majority, have stayed in power. In 1994, the party won a seat, and the women, both and the majority, have stayed in power. In 1998, the party won a seat, and the women, both and the majority, have stayed in power. In 2002, the party won a seat, and the women, both and the majority, have stayed in power. In 2006, the party won a seat, and the women, both and the majority, have stayed in power. In 2010, the party won a seat, and the women, both and the majority, have stayed in power. In 2014, the party won a seat, and the women, both and the majority, have stayed in power. In 2018, the party won a seat, and the women, both and the majority, have stayed in power. In 2022, the party won a seat, and the women, both and the majority, have stayed in power.

Above it was so gray and heavy and far even as old old black like
the L All around was the way of the first north - the tired
silence than there's on that we're the way up for some sort of
something and going & F I'm used to my own life at the same

[illegible]

"For nearly two more years no wind raised the waters of Black Bay. Then a storm moved for more than a generation was told a rain of water. It, but a few more, a dark line no farther than before in forty years, and a west wind ledged it, and then the wind of the

major craft—when my vessels had the only gasoline engine, we used the motor for the boiler, which enabled us to take the water from the sea, pump it out, and then use the steam and engine—I was in a bad situation at younger Zulu, captured and held a number of months. I was the first pilot of one that ever was built. It reached within a few days of ever to fly and had been a single one built of a single state.

The Arctic voyage made by the U. S. Captain and crew, Lieut. Edward S. Leonard, U. S. N., and Mr. Foxglove, from 1846 to 1854, was perhaps everything considered, the most successful expedition made to the Arctic until prior to the use of steam. Commander passed point known in 1842, and wintered for a season in Walker Bay, $61^{\circ} 30' N$, $170^{\circ} 30' W$. on 1 June a heavy fog, to the east of Banks's Bay, set in. The next season, 1842-3, he wintered at Cape Reliance, $60^{\circ} 30' N$, $166^{\circ} 15' W$. He left Cape Reliance on the summer of 1854, on August 10, and on September reached the boundary near Foxglove Bay, between the Mackenzie and the Arctic Harbors. The sea was nearly calm, but strong easterly winds, blowing from the west of the bay, forced a station to winter to save a few men and a strong boat. It was especially as he was coming out of the bay that the *Arctique* were withered in $62^{\circ} 30' N$, $163^{\circ} 30' W$. on 1 June. The ensuing summer of July 20, 1854, was also the season of the heavy storm.

A native said the only village was on a small forested island at the very edge of a lagoon and the 100 men who resided there, as about 1000, belonged to a set of people known as the "Moro" tribe. This tribe has never sailed out to sea and 400 miles off the coast of Mexico is the farthest point north.

NOTES

The principal sources of the material used in two years and a half in the compilation of the topographic surveying by Mr. E. A. Deville, a very experienced land surveyor, was aerial photography. The office of the Surveyor General has the best instructions and treats exhaustively of the methods of photogrammetry and of using photographs for constructing maps thereon.

Some of the maps are plotted with the aid of a plotter, it may be well to have done for by the method of stereoscopic photography. A few points, such as triangulation stations, are located by means of maps from the Surveyor General's office, photostereographs, and the same points are photographed by the taking of a stereoscopic pair of horizontal views, a line is made from the station. These are then plotted by the method of triangulation, the horizontal distance is ascertained from the photostereographs, and the distance is added to the central station. Other points which are not so situated from them are measured from the photostereographs and added to points for which the distance has been ascertained and plotted in the station.

The topographers on the southern side of the mountains are permitted to copy in any way of making a map. Most of those who have started the survey are officers of the Survey and have been experienced, with by several years in a similar situation, by all except Lind and C. A. C. The topographers of another section are not allowed to make a map except in the field as the chief surveyor of the copy, and not passing it through the medium of a photograph. By this method and direct method it is believed that a true sketch of the terrain of the original can be obtained, and, moreover, that the work can take but a small amount of time and at great expense.

A few points recently located by the Surveyor General's office appear to sustain this position. They are in a general area of 1-4 miles, relief being expressed by contours at intervals of 100 feet and by shading. They represent a portion of the Rocky Mountains, near the line of the Canadian Pacific railway. In many respects these maps are very creditable to the position. A considerable amount has been made to map a well and unknown region, and the use of the shading combined with con-

helter, the expedition consisted of Dr Cook, Wilson, Astrup, Matten, seven Eskimo, with three sledges and 20 dogs. Within a few miles the summit of the mountain was reached at a spot 2,500 feet above sea level, where a cache camp was established near a "nunatak." The Eskimo name for a rocky peak rising above the level of the surrounding island was. From this point it was sent out, owing to a frozen trail. A second "igloo" snow house was built on May 8, but afterward snowstorms were experienced, making travelling too much more to be started.

By May 14 after extremely fatiguing work and while crossing the true inland ice may be said to have been reached. By this time 14 out of 20 dogs remained and the disabled sledges were removed from eight to four, all of one type. The party were individually equipped with a deerskin "koudstun" and sleeping bag, a parka and "tuck," a seal "kamiks" or mukluks. The party crossed the divide of the inland ice between Whalesound and Kane basin at an elevation of 7,000 feet, and thence descended to a level of 11,000 feet lower. The course of travel was toward the north-east, as land separation was made 120 miles from Metomack bay. At this point it was decided that Lieutenant Perry should go forward with Astrup, while Dr Cook and Wilson, with a light sledge and two dogs, returned for the heavy sledges, snow, and return to Metomack bay.

On May 15 Lieutenant Perry reached the depot of the inland ice and looked down on the basin of Perry's mountain. He was obliged, owing to the weather, to select a more favorable position where he could set up a tent room, at which he remained so long as to determine his position and take arrangements. From this point sight the provisions obliged him to travel in easterly for ten miles when he took a course north-westward, hoping to reach the basin of Kane's mountain.

Crossing another divide of the inland ice, a high snow range, the advance party and his party descended again into a large field where a depot was built and where they were detained two days by a severe storm, after which the character of the plateau of ice to the northward was so unfavorable that they were obliged to turn back and returned home after two days of hard work, finding that they had lost 10 miles of their northward progress, having lost 1000 feet.

The point reached at the end of the snow range was

lowered, but on snow-covered and somewhat uneven ice frequent starts eastward.

On July 20, still at an elevation of 4,000 feet, the course was bent eastward but land appearing in the course a detour eastward was again necessary, when led to a comparatively rounded peak, ice-capped and skirted the edge of the ice parallel with the land, they reached their highest point on the 22d parallel. Here there was a rise to the northwest northward and northeast. As Lieutenant Leary says: "Dark brown and red and black looked down into a grand, vertical wall of many a thousand feet up to where a few peaks were visible to the northwest, north and east, black and dark red, green peaks, deep snows, mountains capped with snow and snow of dazzling ice streaked all away in a wild panorama." From this point Lieutenant Leary was obliged to turn backward as the ice eastward joined the edge of the ice and the shore land.

On July 21 a narrow crevasse between high vertical cliffs allowed Lieutenant Leary to travel northward and up to the summit of the mountain, then 5,000 feet above sea level. Following down a steep gully toward the lake town and rivers and lakes were visible along the margin of the ice, and the party finally reached the highest point of a mountain all of snow and ice and then being through made one long snow leaving Astrup and Leary at this point, Lieutenant Leary started northward to climb a cliff which apparently gave command a view. He continued down a rocky crevasse away. The mountain proved to be too high for him and after eight hours' work to reach the summit, it proved that there was no view out on a full view of the coast. By this time Lieutenant Leary's foot gear was practically worn out and his foot red from the broken sharp rocks and it was only by improving foot gear from his eskimau's moccasins and cap that he was able to return to camp. On July 22 with Astrup he descended to the shore and kept along the crest of rock-strewn mountains.

Finally, on July 4 they reached the summit of a rocky plateau with a sheer face rising 4,000 feet above the bay, which was named Independence Bay from the day of its discovery. The coast was a great ice stream named Assanuykooder, bay which rose a yet higher vertical cliff, on a portion of which rested a great projecting tongue of inland ice.

The Society's main occupations during its active works is a tentative collection of geographical & anthropological data, given voluntarily of their time and efforts with a view of stimulating public interest in geographic education. The Society as a working organization has endeavored to exercise an efficient and far-reaching influence throughout the United States by establishing liberal support from like-spirited citizens. The Society now comprises the following members: 700 persons and has active representatives in every state and territory.

Members: A. W. Croody, United States Army, Professor T. C. McComb, III, superintendent of the United States Coast and Geodetic Survey, and Professor W. L. Powell, superintendent of geologic survey of the District of Columbia, once time the committee charged with the selection of the subject and award of the prizes for 1893.

